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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/783,538 | 02/15/2001 | David E. Dana | 1588A1 | 4918 |

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| EXAMINER |
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SALVATORE, LYNDIA

| ART UNIT | PAPER NUMBER |
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| 1771 | 9 |

DATE MAILED: 11/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/783,538

Applicant(s)

DANA ET AL.

Examiner

Lynda M Salvatore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 46-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-45 drawn to an electronic support classified in class 442, subclass 180.
 - II. Claims 46-49, drawn to method for making an electronic support classified in class, 427 subclass 389.8.

2. The inventions are distinct, each from the other because:

The inventions of Group I and Group II are related as the product and method for making and are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the method steps of combining inorganic filler with a matrix material and applying to a surface substrate may be used to produce a variety of non-electric pre-peg layers or can be made without solvent.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mark Sweet on August 26, 2002 a provisional election was made with traverse to prosecute the invention of Electronic Supports and Methods and Apparatus for Forming Apertures in Electronic Supports claims 1-45. Affirmation of this election must be made by applicant in replying to this Office action. Claims 46-49 are

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withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. Applicant is advised that the reply to this requirement to complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Specification

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The title of the invention includes an apparatus for forming apertures in electronic supports. There are no apparatus claims.

Claim Objections

8. Claim 39 is objected to because of the following informalities: Claim 30 recites "wherein *the at* inorganic filler...." Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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10. Claims 9,11,19,27,29,30,40,43,and 44 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
11. The terms "high" and "low" in claims 9,11,19,27,30,40,43,and 44 are relative terms that render these claims indefinite. The terms "high" and "low" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
12. Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
13. Claim 29 is indefinite because it is unclear to the Examiner what the Applicant considers a "sufficient amount" as well as being unclear as to whether electrical shorts are a function of the amount of inorganic filler present in the matrix or the thickness of the electronic support. In other words, the Examiner does not understand what is meant by the phrase "inhibit electrical shorts due to conductive anodic filament formation through a thickness of the electronic support".

Claim Rejections - 35 USC § 102/103

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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15. Claims 1-3, 5-37, and 39-45 rejected under 35 U.S.C. 102 (a) as being anticipated by or in the alternative as 103(a) as being obvious over Novich et al., WO 99/44960.

The published PCT application to Novich et al., is directed to coated glass fiber strands and products thereof (Title). Novich et al., teaches a coated fiber strand having a primary layer of dried residue of an aqueous sizing composition applied to a portion of the surface of the glass fiber. The composition comprises solid lubricant particles, an epoxy-functional organo silane coupling agent, and thermoplastic/polymeric film forming material. Non-hydratable inorganic lubricant particles may be selected from boron nitride, graphite, and metal dichalcogenides (Page 14, 25-30). These particles have a thermal conductivity of about 250-300 Watts per meter K and have a high electrical resistivity (Page 15, 13-15 and Page 17, 4-7). Preferably, the non-hydratable inorganic particles have a lamellar or hexagonal structure (Page 14, 13-34). The Moh's hardness value on the solid lubricant particles preferably ranges from .5 to about 6 (Page 13, 8-10). Novich et al., also teaches various types of hydratable inorganic particulate such as clay mineral phyllosilicates, micas, talc, and montmorillonite which are known to have a high cation exchange and affinity for metals (Page 18, 7-12). The amount of the solid lubricant particles in the size composition can range from .0001 to about 99 weight percent of the total weight basis (Page 16, 5-10). Suitable film-forming polymeric materials include thermosetting and thermoplastic such as epoxy, vinyl esters, polyesters, and polyamides (Page 18, 25- Page 19, 30). Suitable glass fibers include E-glass or E-glass derivatives (Page 9, 20-30). The coated fiber strands may be further processed into chopped strands, twisted strands, roving and/or fabric reinforcements such as wovens, non-wovens, knits and mats, preferably to form a laminate for a printed circuit board (Page 30, 12-15 and 23-30). In this instance the Examiner considers the

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sizing composition of Novich et al., having the all the above aforementioned elements analogous to the *matrix* composition claimed by the Applicant. While Novich et al., further teaches coating or impregnating the fabric with a film-forming thermoplastic or thermosetting *matrix* material to form a composite or laminate suitable for use as an electronic support (Page 31, 10-15) it is reasonable to presume that said sizing composition functions in the same capacity as the Applicant's *matrix* composition. Moreover, the suitable polymeric *matrix* materials taught by Novich et al., are the same as the film forming polyesters, vinyl esters, epoxides, phenolics, aminoplasts or thermosetting polyurethanes (i.e., non-fluorinated polymers) as discussed above (Page 31, 20-25). As such, the Examiner fails to see a difference between the Applicant's *matrix* composition and the sizing composition of Novich et al. Novich et al., further teaches that the electronic support may comprise two or more pre-pegs combined with an electrically conductive layer laminated together (Page 33, 19-21).

With respect to claims 3,22, and 32 the limitation of non-degreased woven glass fiber reinforcement, since Novich et al., does not teach removing the sizing composition and further teaches applying a polymeric matrix material, which is compatible with the sizing composition, to form a pre-peg laminate it is obvious that the woven glass fiber reinforcement of Novich et al., is non-greased.

With respect to claims 11,12, 24,33,34,36 and 37,although the prior art of record does not explicitly teach the claimed thermal expansion, cation exchange, and filler distribution coefficient it is reasonable to presume that said properties are inherent to the invention of Novich et al. Support for said presumption is found in the use of like materials (i.e., clay mineral phyllosilicates, micas, talc, montmorillonite, and boron nitride having a lamellar or hexagonal

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structure) which would result in the claimed property. The burden of proof is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594

In addition, the presently claimed property of thermal expansion, cation exchange, and desirable filler distribution coefficient would have been obviously present once the Novich et al., product is provided. *In re Best*, 195 USPQ 433

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Novich et al., WO 99/44960 as applied to claim 1 above, and further in view of Sproull, US 4,542,106

Novich et al., fails to teach the specific glass composition comprising no greater than 5 weight percent iron, however, the patent issued to Sproull, teaches a glass composition comprising only trace amounts of Fe_2O_3 . Sproull, further teaches that Fe_2O_3 is usually introduced as an impurity to the batch materials, and if present it is usually in the amounts of .2-.3 weight percent of the composition (Column 3, 24-29).

Therefore, motivated to have glass fibers with excellent tensile strength and electrical properties it would have been obvious to one having ordinary in the art at the time the invention was made to use the novel glass compositions taught by Sproull, in the electrical support of Novich et al.

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18. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Novich et al., WO 99/44960 as applied to claim 30 above, and further in view Satoshi, Japanese Patent Abstract, Publication No. 07-276563.


The patent abstract discloses a substrate sheet impregnated with a thermosetting resin comprising inorganic filler and a chelating agent. Therefore, motivated to immobilize generated ions in order to prevent electrolytic corrosion it would have been obvious to use a chelating agent as taught by Satoshi in the sizing composition of Novich et al.


Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynda M Salvatore whose telephone number is 703-305-4070. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

ls 
November 17, 2002


CHERYL A. JUSKA
PRIMARY EXAMINER